

# A Fourth Contribution to the Knowledge of the Hymenoptera of Sarawak.\*

BY P. CAMERON.

For the opportunity of describing the following species I am indebted to Mr. John Hewitt, the present curator of the Sarawak Museum.

## EVANIIDÆ.

### *Pristaulacus fasciatipennis*, sp. nov.

Black, the antennal scape red; the greater part of the anterior femora, their tibiæ and tarsi dark red, the apical 2 joints of the tarsi black; the 4 posterior tarsi dark rufo-testaceous; wings clear hyaline, the median cellule except at the apex, the submedian cellules except the 1st narrowly at the base, a band at the stigma and of its width extending from it to the cubital nervure, covering the 1st transverse cubital nervure and one on the apex, fuscous violaceous; the nervures and stigma black. ♀.

Length to end of 1st abdominal segment 11 mm.

Kuching. September.

Thorax in front armed on either side above the collar with 2 stout teeth, the upper being more slender and sharper; base of mesonotum roundly incised, its sides broadly rounded. Collar longish, smooth and shining, its apex at the sides closely punctured. Midlobe of mesonotum raised, clearly separated, narrowed gradually towards the apex; stoutly transversely striated; the basal two striae separated from the others by a space; its lateral slope is similarly striated; the apex of the mesonotum is coarsely reticulated. Scutellum in the middle stoutly transversely striated, the sides bordered by stout longi-

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\* See also "Descriptions of New Species of *Iphiaulax* and *Chaolta* (Braconidæ) from Sarawak, Borneo," Journ. Str. Br. Roy. Asiatic Soc. XLII. pp. 23-52

tudinal striæ. Median segment coarsely reticulated; the reticulations on the lower part of the pleuræ are longish, regular and oblique; above, the striæ form shorter, more rounded reticulations. Coxæ stoutly, irregularly striated; the hind femora are finely, closely punctured, almost striated, the claws with 4 teeth besides the apical one. Transverse median nervure interstitial or almost so, it touching the hinder edge of the transverse basal.

Apart from the differences in coloration this species differs from the other Sarawak species—*P. erythrocephalus* Cam. in the pronotum being toothed. It belongs to *Deraiodontus* Bradley (which, however, appears to be identical with *Pristaulacus* Kieff. *sensu str.*) except that it has 4, instead of 2 teeth on the pronotum.

#### BRACONIDÆ.

#### BRACONINÆ.

##### *Iphiaulax Hewittii*, sp. nov.

Luteous; the antennæ, a large mark occupying the front, except on the sides below and extending above to the hinder ocelli where it is roundly narrowed, the base of mesonotum, the centre and sides of median segment, the abdomen and the hinder legs, black; the ventral surface white, with large black marks on the sides; wings to the transverse basal and median nervures yellowish hyaline, fuscous beyond; the stigma black, obscure testaceous behind. ♀

Length 8 mm.; terebra 6 mm.

Kuching. September.

Face paler, more yellowish than the rest of the head; rugosely punctured; sparsely covered with long fuscous hair. Apex of mandibles black. Palpi pale testaceous, covered with pale hair. Apex of mesonotum flat. Median segment covered with longish white pubescence. First abdominal segment broad, as long as the 2nd; smooth, its centre near the apex irregularly, stoutly striated; the lateral depressions broad, smooth. The area on the 2nd segment is large, smooth, tri-

angular, longer than its width at the base; its apical keel short; the lateral basal areae are clearly defined, smooth, triangular; except on the areae and the apex the segment is irregularly, closely striated; the 3rd segment is irregularly punctured on either side of the middle, the smooth central part being triangular. Sutureform articulation deep, closely crenulated; there is a narrow obscurely crenulated furrow on the apex of the 3rd segment and an obscure indication of one on the apex of the 4th. Hypopygium black in the centre, the sides pale.

A species closely allied to *I. thepsis* Cam., with which it agrees in colouration, except that the latter has not the head and base of thorax marked with black; otherwise *thepsis* is easily known by the very much smaller plate on the base of the 2nd abdominal segment—*I. portius* Cam. is similarly coloured, but is much larger; the area on 2nd segment is stoutly bordered by oblique striae, the 3rd is closely striated throughout and the yellow-hyaline extends to the recurrent nervure.

*Iphiaulax sadongensis*, sp. nov.

Luteous, the antennae, front, vertex, occiput and outer orbits, black, the wings to the lower half of the transverse basal nervure and to shortly beyond the transverse median, yellowish-hyaline, the costa and nervures reddish-luteous in the yellow basal part; the rest of the wings dark fuscous; the basal half of the stigma reddish luteous; the usual cloud in the 1st cubital cellule yellowish-hyaline. There is a small, pyriform mark on the sides of the front at the top of, and touching the eyes; the centre of the 1st abdominal segment and the 2nd and 3rd are strongly, closely longitudinally striated; the 1st with a stout keel down the middle; there is no defined area on the base of the 2nd segment, beyond the centre being more strongly striated. ♀

Length 13 mm.; terebra 5 mm.

Sadong. August.

Abdomen broad, ovate, as long as the thorax and wider than it. The face and oral region are pale yellowish testace-

ous; they are covered with longish pale hair; in the middle of the face is a deep furrow of uniform width; the face is smooth, flat. Median segment thickly covered with long fulvous hair. Basal abdominal furrows broad, deep, stoutly crenulated; the 1st is broad, deep; the lateral borders smooth there are deep, smooth furrows on the apices of the 3rd, 4th and 5th segments; the oblique furrows on the base of the 2nd are deep. The sides of the segments are densely covered with fulvous pubescence. Wings very large, wide; the transverse median nervure is not quite interstitial. The hind tarsi are black except at the extreme base. There is a distinct transverse furrow at the clypeus. Palpi yellowish.

This species comes nearest to *I. xanthopsis* Cam., from Ceylon, both having black heads; it is larger and stouter; the 2 may be separated thus:

A broad yellow line on the upper inner orbits, extending from the ocelli to the antennæ; the furrow on the top of the face not reaching to the middle ... .. *Xanthopsis*.

Only a yellow mark on the inner upper orbits; the furrow on the face reaching to the clypeus ... .. *Sadongensis*.

*Iphiaulax curvinervis*, sp. nov.

Black, the antennal scape, head, thorax and 4 front legs red; the posterior coxæ, trochanters and femora black, tinged with brown; palpi pale testaceous, covered with white pubescence; wings highly iridescent, hyaline, the base slightly, but distinctly infuscated, the costa, stigma and nervures pale fuscous; the transverse median nervure sharply, obliquely sloped in a line with the transverse median; the prædiscoïdal nervure roundly curved towards the cubitus, the discoïdal cellule being therefore narrowed at the apex. The basal 5 abdominal segments are strongly, closely longitudinally striated; the striation on the 1st segment is sparser and more irregular; in the centre of the apical part is a stout longitudinal keel, which bifurcates at the base; the segment is of equal width throughout and is distinctly longer than the second. The area on the 2nd segment is stoutly striated, becomes gradually narrowed and extends to the apex of the segment. Suturiform articulation

narrow, crenulated; there is a curved crenulated furrow on the base of the 4th and 5th segments, and distinct transverse ones on the apices of the 3rd, 4th and 5th; the 6th is depressed at the base and is finely closely, striated there. The 3rd segment is suffused with rufous in the middle. The hind coxæ are longer than usual; these are 3 times longer than wide. The pubescence on the legs (especially the hinder) is long and dense. ♂.

Length 8 mm.

*Hab.* Kuching.

This species is distinguished by the oblique transverse median nervure and by the præbrachial nervure being roundly curved at the prædiscoidal cellule towards the cubitus. Otherwise it is not unlike *I ezerias* Cam.

*Iphiaulax imaus*, sp. nov.

Black, the head, pro- and mesothorax and 4 anterior legs red; the wings uniformly dark fuscous, the costa, nervures and stigma black; the basal 5 segments of the abdomen closely, uniformly longitudinally striated; the plate on the 2nd segment smooth and shining, the basal part broader than long, its apex obliquely narrowed; the apical continuation extends beyond the middle of the segment and becomes gradually narrowed to a sharp point; the suturiform articulation is rufous in the middle. ♀.

Length 9 mm.; terebra 7 mm.

Kuching. December, 18th.

Head smooth, the face sparsely covered with long white hair; the head is cubital; the temples nearly as long as the upper part of the eyes; they are straight, not narrowed, with the hinder part rounded. Frontal furrow narrow, deep, extending from the ocelli to the antennæ. Antennal scape with a projection—broad at the base, narrowed towards the apex—on the apex below and extending close to the apex of the 2nd joint. Apex of mesonotum depressed, flat in the middle; its apex is bordered by a smooth, narrow transverse keel; behind which is a crenulated one. The base of

the metapleuræ and the metanotum in the centre at the base are red; the metanotum covered sparsely with long white hair; the metapleural furrow is wide and deep. The basal half of the central part of the 1st abdominal segment is smooth and shining, and there is a smooth line down the centre of the apical part, this line being aciculated towards the apex. Sutureform articulation deep, closely crenulated; there is no furrow on the apex of the 2nd segment, or on the 3rd; there is a narrow, distinct, crenulated furrow on the base of the 4th. Ventral segments white, with large black marks on the sides. The abdomen is as long as the head and thorax united and is wider than the latter. Palpi black, covered with white hair. Legs thickly covered with short, white pubescence; the middle coxæ are infuscated before and behind.

*Iphiaulax triornatus*, sp. nov.

Rufo-testaceous, the antennæ, 3 large marks on the mesonotum, the apical 2 segments of the abdomen, and the hind legs, black; wings hyaline, the costa and stigma black, the nervures paler, the base of the stigma whitish testaceous. ♀.

Length 7 mm.; terebra 3 mm.

Kuching.

Abdomen broad, ovate, as long as the thorax; the area on 2nd segment small, triangular and with a smooth keel twice its length. The central area of the 1st segment is smooth in the middle, the sides reticulated; the lateral furrows wide, irregularly transversely striated in the middle. The 2nd to 4th segments are longitudinally, closely rugose; the sutureform articulation crenulated; there is a similar furrow on the base of the 4th and a narrower one on the 5th; there are narrower crenulated furrows on the apices of the 4th and 5th. Temples long, not narrowed behind, the hinder edges rounded. Face somewhat strongly but not closely punctured; there is a triangular depression over the clypeus. Malar furrow distinct, deep. Hind legs stouter than usual; the femora on the basal half above and a ring on the base of the tibiæ testaceous; the tarsi are shorter than the tibiæ; thick, the metatarsus as long as the following two joints united. The black apical



segment of the abdomen is narrowly edged with white at the apex.

*Iphiaulax alboornatus*, sp. nov.

Rufo-testaceous, the flagellum of antennæ black; the 4th and 5th segments of the abdomen broadly black; the 6th and the sides and ventral surface of the 7th white; the head paler coloured than the thorax; wings hyaline, the basal half suffused with fulvous; the basal nervures testaceous, the apical black; the parastigma and stigma black, the base of the latter testaceous. ♀.

Length 7 mm., terebra 4 mm.

Kuching. March.

Basal 5 segments of abdomen closely rugosely striated, the striæ becoming weaker towards the apex; area on 2nd segment smooth, triangular, not quite so long as it is wide at the base; the 1st segment is wider at the apex than it is long; the lateral furrows are transversely striated. Suturiform articulation wide, crenulated; it is the only transverse furrow. The abdomen is elongate oval and is slightly longer than the head and thorax united. Head cubital, the temples broadly rounded behind, densely covered with short pale pubescence. Face closely, finely punctured, a wide, deep, short furrow in the centre of the top. Front with a distinct furrow down the centre. Third abscissa of the radius as long as the basal two united; recurrent nervure not interstitial; there is a minute cloud below the parastigma. Parapsidal furrows shallow. The edges of the lobes of the mesonotum are paler than the centre.

EXOTHECINÆ.

*Spinaria Westwoodi*, sp. nov.

Rufo-testaceous, the back of the abdomen darker coloured, the flagellum of the antennæ black, the hinder tarsi black and thickly covered with black hair; wings fuscous, the anterior to the transverse basal nervure yellowish hyaline; the posterior with the basal half yellow-hyaline. ♀.

Length 8 mm.

Kuching. June.

Head, pro- and mesothorax smooth; the metanotum sparsely punctured, all the abdominal segments closely, strongly longitudinally striated. The spine on the pronotum is stout, long and curved. Near the apex of the propleuræ are 2 stout, curved keels; in front of them 2 short ones on the lower side; there are 3 stout keels in front of the spine on the pronotum. Scutellar depression large, with 2 keels. Base of metanotum depressed and with a keel down its centre; down the middle, extending from close of the base to the apex, is a longitudinal keel; bordering it on the apical half is, on either side, a roundly curved keel, uniting these with the central; below the middle, is an oblique curved one, from the outer edge of which runs upwards an oblique one; the sides are stoutly keeled, the keel dilated into a blunt tooth below the middle; from these teeth 2 keels run to the inner keel, forming an area, open at the lower innerside, below these are 2 longitudinal keels, forming a closed area, twice longer than wide. Pleural furrow shallow, smooth. The central keel on the apex of the 3rd abdominal segment becomes thickened into a blunt tooth; there is a similar projection on the middle of the 4th, but much larger, and it commences near the base of the segment; the sides of the 3rd segment project at the apex into a stout tooth, narrowed towards the apex; a similar, but longer and stouter tooth, is on the sides of the 4th; the last segment ends in a longish curved spine. The furrows are deep and stoutly striated; the basal slope of the 1st segment is smooth; in the middle are 2 keels, and the sides are also keeled. The median segment, breast and legs are densely covered with fulvous pubescence. The back of the abdomen may be infuscated.

Allied to *S. curvispina* Cam. and *S. dimidiata*, West. Both of these species have the abdomen for the greater part black. The species is a *Spinaria* as limited by Enderlein (Stett. Ent. Zeits., 1905, p. 229), *Spinaria* being now limited to the species with a spine on prothorax.

#### SPATHIINÆ.

*Habnoba petiolata*, Cam.

This species (described Journ. Straits Branch Royal As.

Jour. Straits Branch



Soc. 1905, p. 107) has been sent by Mr. Hewitt from Kuching. It is probably variable as regards the colouration of the legs and thorax and as regards the amount of red they bear. The prothorax in Mr. Hewitt's example is entirely red; the middle lobe of the mesonotum is largely suffused with rufous, the fore legs, except the tarsi, are rufous testaceous, the coxæ being of a brighter tint than the rest; the middle legs at the base are brownish, the tibiæ being lighter coloured than the femora and the tarsi, except for the white basal band, are fuscous. The palpi, it may be added, are long, the maxillary reaching to the base of the metanotum; the 4 anterior femora are dilated at the apex, the fore pair more distinctly than the middle.

## DORYCTINÆ.

*Neotrimerus nigrobalteatus*, sp. nov.

Reddish testaceous, the sides of the basal two segments of the abdomen and the 3rd and following segments of the abdomen greyish green, the antennæ, an oblique mark on the sides of the 2nd abdominal segment at the area, a transverse one on the side of the 3rd and transverse ones across the 4th to 6th extending close to the sides, black; legs coloured like the thorax; the hinder tarsi blackish; the spines on the hinder coxæ pale yellow; wings to the transverse median nervure fulvous, suffused with fuscous, the rest dark fuscous, the stigma and nervures black.

Length 11-12; terebra 4 mm.

Kuching, November.

Head, pleuræ and metanotum densely covered with longish white pubescence; the mesonotum and scutellum smooth shining, glabrous; the legs, except the tarsi, are densely covered with long white hair; the pubescence on the tarsi is shorter and stiffer; the apices of the joints are spinose. Face rugosely punctured, its centre raised, narrowed below; the clypeus is distinctly punctured. Except on the pleuræ behind, the prothorax is strongly, closely punctured, the pronotum more strongly than the pleuræ, which, below the suture, are irregularly striated. The oblique suture, on the mesopleuræ and that over

the sternum are crenulated. Metanotum closely reticulated, a keel down its centre; the metapleuræ punctured at the base, irregularly reticulated elsewhere. The basal 4 segments of the abdomen are closely longitudinally striated, the striæ becoming gradually weaker; the base of the 5th segment is weakly punctured; the apical two are smooth and shining. The basal tooth on the hind coxæ is long, curved; and its apex reaches to the end the coxæ; the lower one is much smaller, hardly one fourth of the length of the upper. The 2nd cubital cellule is clearly longer than wide, its apex being not much more than half its length on the posterior side; the 2nd transverse cubital nervure is about the length of the 1st abscissa of the radius; it is shorter than the 1st, the 2nd cellule being thus narrower at the apex than at the base.

There are 5 short, stout spines on the innerside of the fore tibiæ; the abdomen is broader than the thorax; it is longish oval and is as long as the head and thorax united; the ocelli are in a black spot; a keel runs down from them to the antennæ; the antennæ are filiform, much longer than the body. The longitudinal nervure in the hind wings is roundly curved.

#### AGATHINÆ.

##### *Disophrys tinctipennis*, sp. nov.

Luteous, the flagellum and the hinder tarsi black; wings fuscous, the base to the transverse median and to the top of the transverse basal yellowish hyaline, the hinder fuscous, yellowish hyaline at the base. ♂.

Length 8 mm.

Kuching. September.

Flagellum of antennæ thickly covered with black, the scape and thorax with fulvous pubescence. Face, clypeus and thorax distinctly, moderately closely punctured. The keel running from the outer ocelli to the antennæ is stout; in the centre is a narrower keel. Middle lobe of mesonotum separated; in its middle, on the basal slope, is a stout keel, which ends in 2 fine ones. Mesopleuræ furrow irregularly crenulated. Scutellar depression large, with 3 stout keels in the middle;

the apex of scutellum bordered by a stout keel; the scutellum is more strongly punctured than the mesonotum. Post-scutellum stoutly keeled laterally, the united keels produced behind. Areola longer than it is wide at the apex, which is transverse, the base is narrowed obliquely to a sharp point; this is bordered at the base by a triangular area, the apex being shortly beyond the middle of the areola; a keel runs from its base to the top of the apical slope which is bordered by a stout keel; the areola thus formed is four-angled, the base being long and sharp-pointed; the spiracular area is large; on the apical slope is a large central with an irregular keel in its middle and a smaller square area. Below the middle of the mesopleuræ, on the apical half, is an oblique furrow, which encloses with the lower wider crenulated one a triangular area. The keel bordering the sides of the metanotum is twice roundly dilated at the base, the basal being the longer, below these at the apex is a small and a large bluntly rounded tooth. Abdomen smooth; the basal segment is more than twice longer than it is wide at the apex, it is as long as the following 2 segments united. The malar space is half the length of the eyes. Areolet narrowed in front, the nervures touching there; the outer one is obliquely sloped towards the cubitus, the lower, and much smaller part, is sloped towards the base of the cellule.

*Cremnops borneana*, sp. nov.

Luteous, a broad band across the ocelli, the antennæ, apex of the hind tibiæ and the hind tarsi, black; wings fuscous; the base of the stigma and the nervure yellow; the base to the transverse median nervure and to near the lower part of the transverse basal yellowish hyaline; a hyaline cloud fills the 1st cubital cellule and extends across to the base of the anal nervure. ♀.

Length 7 mm.; terebra 4 mm.

Kuching. October.

Head and thorax closely covered with short white pubescence. Palpi coloured like the head. Malar space as long as the eyes. Thorax closely covered with short pale pubescence;

mesonotum with a shallow furrow on the basal slope. Areola  $\Lambda$ -shaped, pointed to the base of the metanotum by a  $\Lambda$ -shaped furrow; it bears 3 stout, transverse keels, the basal being less distinct than the others; from it stout transverse keels run to the outer edge of the metanotum, the lower ones going beyond the spiracles. Areolet square; the recurrent nervure is dilated backwards at its junction with the cubitus; the transverse median nervure is received shortly beyond the transverse basal. The frontal depression is bordered outwardly by a stout, curved rounded keel.

ICHNEUMONIDÆ.

*Pimplinae.*

*Epirhyssa tuberculata*, sp. nov.

Black, the basal segments of the abdomen tinged with brown; the inner orbits opposite the eyes broadly, the face, clypeus, the outer orbits from near the top of the eyes broadly, a broad, oblique mark on the sides of the pronotum in front, base of tegulæ, a mark on the scutellar keels, a mark, about the same size, on the sides of the scutellum at the base, 2 large marks on the median segment, broadly dilated inwardly at the base of the metanotum, where they are separated by a narrow black line, proceeding downwards along the outerside of the spiracles and having, immediately below, on the apex of the metapleuræ, a smaller mark, longer than wide and dilated above the tubercles, a large mark immediately below these, reaching the sternum at the base and having the lower outer edge bi- if not tridentate; a minute line on the apex of the 1st abdominal segment, 2 large transverse marks near the apex of the 5th, a small, somewhat heart-shaped, mark shortly behind the middle of the 6th in the centre, a much larger mark, twice longer than wide, and slightly narrowed towards the apex, the anterior legs, except the tarsi, in front, a large, somewhat pyriform, mark on the outerside of the middle coxæ, a broad stripe down the middle of the hinder coxæ, the apex of the middle femora below; the posterior almost entirely below and the middle tibiæ behind, bright sulphur yellow. Wings fulvo-hyaline, the

apex of the anterior (especially the radial cellule) fuscous violaceous, the nervures and stigma black. ♂.

Length 28 mm.

Kuching.

Face closely punctured, thickly covered with short white pubescence. Clypeus smooth, broadly depressed in the middle, broadly bilobate. Labrum bilobate, the lobes more widely separated than those of the clypeus, darker coloured and more oblique. The striation on the mesonotum is coarse; on the apex in the middle it is closer and more rugose, more reticulated. Scutellum finely, irregularly transversely striated; the rest of the thorax and the abdomen is smooth and shining. The basal abscissa of the radius is straight and oblique, the apical is broadly roundly curved towards the costa; the recurrent nervure is received beyond the transverse cubital at a slightly greater distance than the length of the latter; the transverse median nervure is received shortly beyond the latter; the transverse median nervure in the hind wings is broken near the top. Antennæ slightly serrate towards the apex; the scape is yellow below. The hind tibiæ are brownish above, yellowish below. Mandibles black, shortly, bluntly bidentate. Palpi yellow. Temples short, rounded. The tubercles are prominent; the lower part of the metapleuræ project into prominent tubercles, longer than wide, somewhat pyriform, dilated posteriorly above. The 1st segment of the abdomen is long, narrow, about one fourth longer than the 2nd. The disco-cubital nervure is only indistinctly broken. The occiput is almost transverse.

Taking this species as a typical *Epirhyssa*, the latter genus may be separated from *Rhyssa* thus:

Fore wings with an areolet; the 1st abdominal segment shorter than the 2nd ... .. *Rhyssa*

Fore wings without an areolet, the 1st abdominal segment clearly longer than the 2nd. ... .. *Epirhyssa* Cr.

The agreement with them otherwise is very close. In *Epirhyssa spilopectera* Cam., from Borneo, the 1st abdominal segment is hardly longer than the 2nd in the ♀.

*Xanthopimpla lissonota*, sp. nov.

Luteous, the abdomen darker coloured, the antennæ

brownish, black above; the ocellar region, 3 marks on the mesonotum, the central irregular, broader than long, the lateral larger, conical, twice longer than broad, almost transverse at the base, rounded and narrowed at the apex, 2 marks on the 1st, 3rd, 5th, and 7th abdominal segments—the 4 middle marks larger, broader than long, the 1st and 4th smaller rounded—and the base of the hinder tibiæ narrowly, black; wings hyaline, the apex slightly, narrowly, smoky, the ovipositor clearly longer than the hinder tarsi. ♀.

Length 12 mm.; terebra 4 mm.

Kuching.

Areola 4-angled, narrow; the tooth bearing area oblique, triangular, transverse, sharply pointed on the innerside; the basal lateral area narrowed on the innerside; the outer keel roundly curved outwardly. Face flat, closely punctured; the clypeus gradually, roundly narrowed to a sharp point. Areolet 4-angled, shortly but distinctly appendiculated; the recurrent nervure is received shortly beyond the middle. Basal two segment of abdomen smooth, shining, impunctate; the others closely punctured; the transverse furrows narrow, shallow, crenulated. First abdominal segment twice longer than its width at the base; the 2nd square, the others broader than long. Front, vertex and entire thorax smooth, shining, impunctate. Face longer than broad; the clypeal fovea deep. Scutellum roundly convex.

Belongs to Krieger's Group. I. (Berich. d. Naturf. Gess. zu Leipzig, 1898, p. 92). It is allied to *punctata* Fab. *Sec.* Krieger, but, inter alia, wants the spots on metanotum.

*Xanthopimpla bimaculata*, sp. nov.

Luteous, the head and thorax smooth, impunctate, the mesonotum with 2 large conical spots; the front and vertex broadly in the centre, the occiput with a much broader mark a small mark, wider than long, on the sides of the metanotum, and marks on the 7 basal segments of the abdomen, black; the areola large, 6-angled, longer than wide; wings hyaline, the nervures and stigma black; the ovipositor shorter than the hind tarsi. ♀ and ♂



Length 12 mm.; terebra nearly 3 mm.

Kuching. February.

Tooth-bearing area 4-angled, of equal width throughout. The black, paler below. Face slightly longer than wide, distinctly, closely punctured. Parapsidal furrows indicated only at the base. The 1st abdominal segment longer than it is wide at the apex; the middle segments are more strongly and closely punctured than the basal or apical. Areolet 4-angled; appendiculated, the recurrent nervure received in the middle.

Belongs to Krieger's Group E. (*l. c.* p. 81.) characteristic are the 2 marks on the mesonotum, instead of the usual 3. The ♂ is similarly marked, but with 8 pairs of black marks on the abdomen.

#### CRYPTINÆ.

##### *Polyaenus spiniferus*, sp. nov.

Black, face, clypeus, mandibles except the teeth, palpi the orbits narrowly, except near the top on the outside, the line widest at the vertex, a line on the apical half of the pronotum, narrowed in front, tegulæ, scutellum, a broad line—broadest on the sides—on the sides and round the top of the metanotum, covering the spines, the spines, tubercles, a large oblique mark, twice longer than wide, near the middle of the mesopleuræ, commencing at the base and reaching to the base of the apical third, a curved mark below the hind wings, a large mark on the centre of the metapleuræ, broad and rounded at the base, gradually roundly narrowed towards the apex, a broad line, dilated backwards laterally, on the apex of the 1st abdominal segment, lines covering slightly more than the apical third of the 2nd segment, a slightly narrower one on the 3rd and the other segments, except narrowly at the base, yellow; the ventral segments are for the greater part yellow. Four front legs pale fulvous, their coxæ and trochanters yellow; the hind coxæ yellow, broadly black round the outside and along the top of the apex, the trochanters yellow, broadly marked with black above, the femora rufo-fulvous, black at the apex; the tibiæ and tarsi yellow, the former with the base narrowly and the apex more broadly black. The antennæ

have the 5th to the 20th joint white, spotted with black above. Wings hyaline, the nervures and stigma black. ♀.

Length 11 mm. ; terebra 2 mm.

Kuching. December and March.

Face strongly, the clypeus more weakly punctured. Front and vertex smooth and shining; the frontal spines are stout, about twice longer than they are thick at the base. Mesonotum rugosely punctured, shining; the parapsidal furrows are shallow, crenulated. Scutellum flat, sparsely punctured, except at the apex; the post-scutellum smooth, shining. The metanotum behind the keel is transversely striated-punctured; the rest coarsely, closely reticulated; the spines are about twice longer than they are wide at the base; their apex is rounded. Pleuræ closely strongly punctured; the lower half of the propleuræ strongly, closely striated; the apex of the mesopleuræ is irregularly striated. Scutellum flat. Metanotum with one transverse keel, and with a closed area, longer than wide, in the middle at the base. Temples very short, almost obsolete at the top behind the eyes. Malar space distinct, half the length of the antennal scape. Transverse median nervure interstitial; the recurrent nervure is received near the apex of the areolet. Transverse median nervure in hind wings broken shortly below the middle. Tubercles small. Post-petiole widely dilated; the base of the petiole wider than the height of the sides.

The ♂ is similarly coloured, except that the marks on the pleuræ are smaller; the antennæ are much longer than the body, the post-petiole is narrower, longer compared with its width; the antennæ are not serrate and are broadly white in the middle.

This species does not appear to differ much in generic characters from the neotropical species of *Polyænus*; the only differences appear to be that in the American the transverse median nervure is not interstitial, but received behind the transverse basal; that the temples are longer, and distinctly obliquely narrowed, that the scutellum is not so flat, that there is no distinct area at the base of the metanotum, and that the abdominal petiole is longer, narrower and not nearly so much widened at the apex.

Tosquinet, it may be added, has described a species *P. cingulatus* which he refers to *Polyænus* from New Guinea. (cf. Mem. de la Soc. Ent. de Belg. X. 45). *Polyænus* may be described as a *Skeatia* with 2 spines placed side by side on the front and with the parapsidal furrows less distinct.

## SPHEGIDÆ.

*Sphex (Isodontia) Hewitti*, sp. nov.

Black, the apex of the 2nd abdominal segment narrowly, the apical half of the 3rd and the whole of the following abdominal segments, the face, clypeus, lower inner orbits, and tubercles covered with silvery pubescence; the hair on the head long, dense, fuscous, it is longer on the vertex and on the outer orbits below, than else where; the hair on the mesonotum is short, dense and fuscous; it is sparser and shorter on the scutellum and as dense and longer on the median segment. Basal segments of abdomen bare, the apical densely covered with bright fulvous pubescence. Wings almost hyaline, highly iridescent, the radial cellule and a brown band (extending to the 2nd recurrent nervure) round the apex fuscous tinged with violaceous. ♂.

Length 28 mm.

Kuching. March.

Eyes slightly, but distinctly converging at the top. The posterior ocelli, on the outer side, are united to the anterior by a narrow furrow, from the anterior a narrow one runs down to the antennæ. The vertex and upper part of the front one finely, but not closely, punctured. Clypeus broadly, roundly, uniformly, convex; its apex almost transverse; there is a minute depression at the apex, shallow and hid by the pubescence. Mandibles bidentate, the teeth large, diverging, the lower longer and sharper than the upper. Pronotum placed below the level of the mesonotum and clearly separated from it; its apex broadly depressed, obliquely depressed towards the mesonotum. Mesonotum somewhat strongly, but not deeply punctured; the scutellum is a strongly punctured and has a narrow smooth line down the middle. Post-scutel-

lum rounded, clearly separated, not furrowed or tuberculate in the middle. Metanotum closely, distinctly and deeply punctured, the punctures appearing to form reticulations in places; there is an oval fovea in the centre near the end of the upper part; the apical slope in the centre above projects, the projection being broader than long; the part below it is slightly depressed; the spiracles are bordered behind by a deep, curved furrow; the sides of the apex of the metanotum are bordered by a deep, curved, crenulated furrow. Abdominal petiole nearly twice the length of the hinder coxæ, curved, irregularly punctured above, on either side of a shallow longitudinal furrow. The 3rd joint of the antennæ is slightly longer than the basal two-joints united; the 4th is about one fourth shorter than it; the latter is shorter than the 5th. The 1st and 2nd transverse cubital nervures are obliquely sloped, parallel; the 2nd cubital cellule is clearly longer than wide; the 3rd cubital cellule is much narrowed in front, being there not much longer than the space bounded by the 2nd transverse cubital and the 2nd recurrent nervures; the 1st recurrent nervure is received about half the length of the third abscissa of the radius from the 2nd transverse cubital, the 2nd about its length from it. The transverse median nervure is not quite interstitial; the neuration being very similar to that of *S. umbrosus*, cf. Kohl, Ann. K.K. Natur. Hofmus. V. Taf. VIII. f. 10. Claws bidentate, the basal slightly longer and thinner than the apical. The labrum is broadly rounded, neither toothed nor keeled. The 3rd to 5th ventral segments are roundly incised, the incision on the 5th being deeper than on the others; the last ends in a sharp point and is covered with long fulvous hair. The abdominal petiole is shorter distinctly than the hinder tibiæ, being almost of the length of the hinder metatarsus.

Should be readily recognized by the red apical segments of the abdomen from the known Indian and Malay species. In this respect it agrees with *S. confrater* Kohl from New Britain with which it cannot well be confounded. *Sphex Franzi* Cam. Ann. Mag. Nat. Hist., April 1902, 246 from Borneo has the abdomen ferruginous, except the petiole and the wings are fuscous violaceous.

## POMPILIDÆ.

*Salius Ridleyi*, sp. nov.

Claws with 1 tooth. Black, the abdomen with purple reflections; the 2nd and following joints of the hind tarsi, except at the apex, testaceous; wings blackish; fuscous-hyaline, slightly tinged with yellow, between the transverse median and the transverse basal and the 2nd transverse cubital and the 2nd recurrent nervures; the hind wings blackish at the base, the rest fuscous hyaline, tinged with yellow. ♂.

Length 21 mm.

Matang.

Front and vertex sparsely, the outer orbits densely covered with long black hair; the lower two-thirds of the inner orbits lined with obscure testaceous. Clypeus minutely shagreened, and with some scattered punctures; bare, the apex broadly rounded. Labrum large, shagreened; its apex rounded. Palpi black, bare, the apical joints covered with a pale pile. Thorax velvety, the prothorax and the median segment covered with long black hair; the sides of pronotum broadly rounded, not projecting. Post-scutellum prominent, clearly separated, tuberculate, the base with a straight oblique slope; its apical slope is shorter and steeper. The striation on the metanotum is coarse; the lateral tubercles are very prominent. Metapleuræ finely, closely, obliquely striated. Tibiæ sparsely, the tarsi more thickly spinose; the spines short; the long spur of the hind tibiæ is thickly covered with black hair at the base; it is about one third of the length of the metatarsus—as long as the 2nd joint. The 2nd transverse median nervure is dilated in the middle, where the recurrent leaves it, the latter being also dilated (but not so strongly) at the base; in the hind wings the transverse anal nervure is received beyond the cubital.

Comes near to *S. fulgidipennis* Sans. and *S. iridipennis* Smith. The colour of the middle joints of the hind tarsi may be clear yellow, as it is on the 2nd joint of one leg, *i.e.* the testaceous colour of the other joints may be owing to discolouration. The coloured tarsal joints and the testaceous (yellow?) line on the inner orbits are probably characteristic.

## VESPIDÆ.

*Vespa annulata*, Smith.

This form has been taken by Mr. Hewitt at Santabong Matang (December) and Kuching (January). In the recently published Monograph of the genus *Vespa* by the Viscount du Buysson (Ann. Soc. Ent. de France, LXX, III, (1904) p. 542), *annulata* is considered to be a variety of *bellicosa* Smith. I am not sure but that when the ♂ has been discovered, it will be proved to be a good species.

If not a distinct species it certainly forms a well-marked race of *bellicosa*.

*Vespa bellicosa* (type) has been taken by Mr. Hewitt at Pulo Burong.

*Ichnogaster clypealis*, sp. nov.

Black; the clypeus, except for a black, broad line, of equal width, transverse at the apex, about twice wider than long, on the upper two-thirds, a line on the base of the pronotum, one round its apex, a somewhat semicircular mark on either side of the base of the scutellum, 2 longer, almost united marks on the post-scutellum, the apex of the metanotum, the mark divided by the central furrow, the sides largely, roundly dilated, backwards and forwards; a large conical mark (the narrowed end below) on the top of the mesopleuræ, its apex bordered by the furrow, a large curved mark, roundly narrowed above, straight and oblique below, an irregular conical mark on the metapleuræ the upper part dilated at the base, a line, 4 times longer than wide, on the sides of the node of the petiole, a mark narrowed to a sharp point on the sides of the 2nd segment at the base, a large, transverse conical mark on the sides, the ends rounded, the narrow end on the innerside, a longish curved mark, narrowed at the base on the sides of the 2nd ventral segment and a shorter, broader one, on the sides of the 3rd yellow; the yellow on the abdomen being paler than it is on the head and thorax. Four front legs yellow, largely marked with brown above, the middle more largely than the anterior, their tarsi are for the greater part brown; the hind legs fuscous, suffused with yellow, their coxæ



yellow above. Wings hyaline, the nervures and stigma black; the 4th abscissa of the radius distinctly longer than the 3rd ♀.

Length 13 mm.

Bidi, December. Kuching, October (Shelford).

Flagellum of antennæ fuscous below. Pubescence on the front and eye incision pale golden. Apex of mesonotum finely closely, longitudinally striated; the basal half of metanotum, on either side of the furrow, more strongly, obliquely striated. Pleural furrows weakly crenulated. Abdominal petiole as in *I. nigrifrons*. The 2nd and 3rd transverse cubital nervures are straight and parallel.

Allied to *I. nigrifrons* and *I. nigricans*. These 3 species may be separated thus:—

a. Clypeus yellow, with a broad black mark on the top, the yellow marks on the pleurae large ... *Clypealis*.

b. Clypeus black, the marks on the pleurae small. Pleurae black, mesonotum and abdomen immaculate, metanotum longitudinally striated ... *Nigricans*, Cam.

Pleurae for the greater part rufous, mesonotum and abdomen maculate with yellow, metanotum transversely striated ... *Nigrifrons*, Sm.